

REMARKS

I. Status of the Claims

Claims 324-401 are pending. By this amendment, Applicants have amended claims 324, 326, 330-333, 336, 338, 342-345, 348, 349, 351, 353-355, 358, and 360-363. Support for the amendments can be found in the original specification and claims, as filed. For example, support for the recitation that the mercapto alkanol ester of a carboxylic acid is present in an amount from 2 to 25 times the amount of the Sn component of the metal containing stabilizer in independent claims 324, 336, 348, 349, and 358 can be found in the specification at the paragraph bridging pages 19-20.

Similarly, support for the recitation that the amount of the mercapto alkanol ester replaces from about 20% to about 90% by weight of the metal containing stabilizer, wherein the resulting composition has a heat or light stability at least comparable to a composition where the mercapto alkanol ester does not replace about 20% to about 90% by weight of the metal containing stabilizer, can also be found in the specification at the paragraph bridging pages 19-20, as well as in the Examples and results shown therein. See, e.g., Example 3, page 24 ("a reduction of 72% in the weight of organotin compound is achieved by replacing it with a considerably less expensive mercapto ester"), Example 4, page 25 ("a reduction of 80% in the amount of tin compound is thereby achieved"), and Example VIII, page 29 ("the addition of the mercapto ester permits a 50% reduction in the amount of organotin compound required to achieve comparable stability.").

By this amendment, Applicants intend to show that by adding the claimed amount of mercapto alkanol ester (i.e., from about 2 to about 25 times the amount of the

Sn component of the metal containing stabilizer), permits the mercapto alkanol ester to replace from about 20% to about 90% by weight of the metal containing stabilizer such that the resulting composition has a heat or light stability at least comparable to a composition where the mercapto alkanol ester does not replace about 20% to about 90% by weight of the metal containing stabilizer.

The remaining amendments are made to correct to minor informalities. For example, the amendment to claims 331, 343, 353, and 362 deleting the phrase "and mixtures thereof," removes a redundancy in these claims since the phrase "at least one chosen from" necessarily includes mixtures of the recited components. In addition, the amendment to claim 348 to recite "a monoalkyltin-tris(mercapto alkanol ester of a carboxylic acid)" is made to correct the problem associated with the dangling bond noted by the Examiner. Support for this amendment can be found in the specification at page 16, as well as original claims 19, 39, and 57, for example illustrating the tin compounds as including monobutyltin trimercaptoethylolate.

Applicants have also added new claims 367-401 to further define different embodiments of their invention. For example, Applicants have added claims 367-370, 377, and 390 to recite the carboxylic acid comprises at least one natural fatty acid present in peanut oil, tall oil, safflower oil, soybean oil, tallow, lanolin, palm oil, or coconut oil. Support for this amendment can be found in the specification at the paragraph bridging pages 10-11.

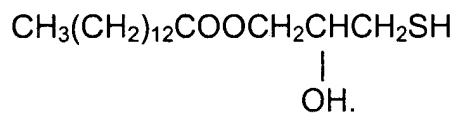
Applicants have also added claims 371-401 to recite other embodiments of the tin-containing stabilizer as comprising bridged sulfur compounds, alone or as mixture with formulas (I) and (II). Support for these claims can be found in the specification at

page 16, as well as original claims 19, 39, and 57. Support for the particular compounds recited in claims 380 to 383 can be found in Examples IV, XV and XVI, as shown on pages 24, 41, and 42, respectively, as well as original claims 29 and 48. Support for the composition comprising a mixture of metal containing stabilizers as recited in claims 384-401 can be found in the specification at page 5 (teaching that the composition may comprise "one or more metal-containing stabilizers.").

Finally, Applicants have amended the specification to correct minor informalities contained in the exemplified compositions. For example, the amendment to page 41 of the specification corrects a missing carbon ["C"] in component D. Accordingly, new matter has not been added.

II. Specification Objection

The Examiner has objected to the specification because the formula recited in Example II on page 22 for 3-thioglyceryl myristate (i.e., $\text{CH}_3(\text{CH}_2)_{12}\text{COOCH}_2\text{CHCH}_2\text{SH}$) inadvertently does not list a hydroxy substituent. Pursuant to the Examiner's request, Applicants have amended the disclosure to correct the formula contained in Example II on page 22 and to recite:



An amendment to correct an obvious error does not constitute new matter where one skilled in the art would not only recognize the existence of error in the specification, but also the appropriate correction. *In re Oda*, 443 F.2d 1200, 170 USPQ 268 (CCPA 1971). As evidenced by the Examiner's assertion, one skilled in the art would not only

recognize the error in the specification, but would know how to correct it. Accordingly, the amendment to correct this error does not constitute new matter. Thus, the objection to the specification has been rendered moot.

III. Claim Objections

The Examiner has objected to claims 332, 344, 354, and 363 under 37 CFR §1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim. The amendments to claims 332, 344, 354, and 363 changing their dependencies render this objection moot.

IV. Rejections Under 35 U.S.C. §112

a. First paragraph

The Examiner has rejected claims 324-366 under 35 U.S.C. §112, first paragraph as containing subject matter which was not described in the specification in such a way to reasonably convey to one skilled in the art that the inventor, at the time of the application was filed, had possession of the claimed invention for the following reasons:

(a) With respect to claims 324-335 and 349-357, the Examiner asserts that some embodiments are not supported by the original disclosure. [Office Action at 6]. In particular, the Examiner asserts that “there is nothing mentioned in the claims that would prevent x and y from being fractional numbers.” [Id. at 7]. This rejection has been rendered moot by the amendments to claims 324 and 349 removing the subscripts n, x, and y, and the amendments to claims 336 and 358 describing x as an integer. Thus, this reason for rejection has been rendered moot.

(b) With respect to claims 324-366, the Examiner asserts that the "open ended recitation [of the ratio of mercapto alkanol ester to Sn] does not fulfill the written description requirement. While Applicants respectfully disagree, to advance prosecution Applicants have amended the independent claims to recite the mercapto alkanol ester of a carboxylic acid being present in an amount from 2 to 25 times the amount of the Sn component of the metal containing stabilizer. Indeed, the Examiner recognizes that this range is taught in the specification, and thus clearly meets the written description requirement under 35 U.S.C. §112, first paragraph. Thus, this reason for rejection has been rendered moot.

For at least the foregoing reasons, Applicants request that all rejections under 35 U.S.C. §112, first paragraph be withdrawn.

b. Second paragraph

The Examiner has rejected claims 324-366 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention for the following reasons:

(a) The Examiner has rejected claims 324-335 and 349-357 apparently because the x and y components of the formulas contained in these claims can comprise fractional numbers. To advance prosecution, and in no way acquiescing to the correctness of this rejection, Applicants have amended claims 324 and 349 to remove the subscripts n, x, and y, and claims 336 and 358 to recite x as comprising an integer. Accordingly, this reason for rejection has been rendered moot.

The Examiner also alleges that claims 324-335 and 349-357 are ambiguous because the formulas do not prevent “y” from being a negative value and “a negative value for y is meaningless.” [Office Action at 6]. This reason for rejection has been rendered moot by the above amendments to claims 324 and 349 removing the subscripts n, x, and y. Applicants thus request that this rejection be withdrawn.

(b) The Examiner’s rejection of claims 324, 336, 349, 358 for allegedly containing n, x, and y values that result in “redundant claims” has been rendered moot by the above amendments. Accordingly, Applicants respectfully request that this rejection be withdrawn.

(c) The Examiner has rejected claims 324-347 and 349-366 for use of the word “mercaptide ligand” or “mercaptide” to describe SR’ (now SR”). According to the Examiner, Applicants terminology is in conflict with the prior art cited in the specification. As support for this position, the Examiner relies on Chapter 9 of the “Encyclopedia of PVC,” edited by Nass (and incorporated into Applicants’ specification on page 14) for the proposition that mercaptides are limited to compounds where S is bonded to alkyl and not any other group. [Office Action at 8.] The Examiner asserts that the R” component of the claimed mercaptide ligand is not limited to an alkyl group, but may include a group such as a derivative of a carboxylic acid, which is not an alkyl group. *Id.*

Applicants agree with the Examiner that R” is not limited to an alkyl group. However, Applicants respectfully disagree with the Examiner’s position that the claimed terminology is in conflict with the prior art. Nass simply exemplifies different dibutyltin compounds that have an alkyl group bonded to S. However, Nass does not support the

Examiner's overly narrow interpretation that all mercaptides require S to be bonded to an alkyl and not any other group.

As evident from the disclosure on page 16 of the present specification, mono and dibutyl tin compounds are "representative compounds," but not the only metal containing compounds encompassed by the claimed invention. The specification at page 14 describes Nass as showing "conventional well-known heat stabilizers for vinyl chloride polymers," not as showing the only heat stabilizers for such polymers. In fact, the teaching of the specification relied on by the Examiner (page 15) clearly shows that the claimed invention, particularly the metal containing stabilizer, is not limited to those representative samples described in Nass. See, e.g., page 15 of the present specification teaching SR^6 , wherein R^6 is not limited to alkyl. If the claims, read in light of the specification, "reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits, the statute demands no more." See MPEP 2173.05(a)[citations omitted]. Accordingly, Applicants respectfully request that this rejection be withdrawn.

(d) The Examiner's rejection of claims 324-347 and 349-366 for using R' to denote different substituents in the metal containing stabilizer and the mercapto alkanol ester has been rendered moot by the amendment changing R' to R" in the metal containing stabilizer. Accordingly, Applicants respectfully request that this rejection be withdrawn.

(e) The Examiner has rejected claims 325, 326, 337, 338, 350, and 359 for use of the term "derivative." According to the Examiner, it is not clear how "the mercaptide ligand can be a derivative of the groups recited in claims 325, 326, 337,

338, 350, and 359. Applicants respectfully disagree and traverse this rejection for the following reasons.

The term "derivative" is commonly used in the chemistry art, and would have reasonably apprised one of ordinary skill in the art of the scope of the claimed invention. The term "derivative" means "a substance that can be made from another substance." MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY 311 (10th ed., 2001). Almost every compound or chemical that has been patented is a substance that is made from another substance, or a derivative of something else. The fact that there may be intermediate compounds (or derivatives) does not render the final product ambiguous, especially where those final compounds are exemplified. For example, one of skill in the art would clearly understand what polyester is despite it being a derivative of an acid and an alcohol, even if the acid itself is a derivative.¹ Therefore, the Examiner's question of "what does a derivative of a derivative mean?" has been answered many times in chemistry. For this reason alone, this rejection is improper and should be withdrawn.

Further, in rejecting claims 325, 326, 337, 338, 350, and 359 for use of the term "derivative," the Examiner repeats the same mistakes resolved more than 30 years ago by the Court of Customs and Patent Appeals. Specifically, in *In re Anderson*, 176 USPQ 331 (CPA 1973), the Court addressed the use of the term "cellulose derivatives,"

¹ For example, as shown in the attached teachings from Hawley's Condensed Chemical Dictionary, fumaric acid is the principal unsaturated acid used in the synthesis of polyester. Well-known methods of making fumaric acid include isomerization of maleic acid or the catalytic oxidation of benzene. Thus, polyester is a "derivative of a derivative" because it is a derivative of fumaric acid, which is a derivative of maleic acid or benzene.

and reversed the section 112 rejection because the Board of Patent Appeals and Interferences

was overlooking the fundamental fact that [the rejected dependent claim] is a limitation on claim 1, the two taken together being a claim to a combination of elements... [and] not a claim to cellulose compounds per se. The board obviously goes too far is say that the term objected to is inclusive of all cellulose derivatives because [the board] ignores the functional limitations in claim 1 [for the cellulose derivatives].

Id. at 335.

Just like *Anderson*, the Examiner's assertion that "it is not understood [] how the mercaptide ligand can be a 'derivative' of, especially, a mercaptoacid ester or a mercaptoalcohol ester since these compounds are themselves derivatives of an acid or alcohol to begin with," overlooks the fundamental fact that the recited "derivatives" are all necessarily excipients, and that the recitations in claims 325, 326, 337, 338, 350, and 359 constitute further limitations on these terms as they are used in the claims from which they depend. Further, the specification also expressly provides many examples of the recited components. [See, for example, pg. 15-16, and Examples III-XV, pages 23-43).

The claim language must, of course, be read in light of the specification as it would be interpreted by one of ordinary skill in art. That is, the Office's "interpretation must be consistent with the one that those skilled in the art would reach." *In re Cortright*, 49 USPQ2d 1464, 1468 (CAFC 1999) (citations omitted); see also MPEP § 2111.01 ("[T]he words of a claim... must be read as they would be interpreted by those of ordinary skill in the art."). In the present case, Applicants submit that it is

unquestionable that “those of ordinary skill in the art” would understand the meaning of “derivative,” as recited in claims 325, 326, 337, 338, 350, and 359.

Therefore, since the courts have previously found the term “derivative” to be definite within the meaning of section 112, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 325, 326, 337, 338, 350, and 359. However, should the Examiner maintain the present rejection, it is expressly requested that the Examiner explain on the record why it has not followed *Anderson* and *Cortright*.

(f) The Examiner has rejected claims 330 and 342 for the following reasons:

(1) According to the Examiner, the scope of claims 330 and 342 overlaps with claims 329 and 341, respectively. This rejection has been rendered moot by the amendment to claims 330 and 342 such that the number of carbon atoms does not overlap with other claims. Accordingly, Applicants respectfully request that this rejection be withdrawn.

(2) The Examiner also asserts that the R in claims 330 and 342 conflicts with the description of R in claims from which they depend, i.e., claims 327 and 339, respectively. According to the Examiner, the fact that R can contain 1 carbon atom in claims 330 and 342 conflicts with claims 327 and 339, which recite aryl groups that cannot contain less than 6 carbon atoms. Applicants disagree. It would be clear to one skilled in the art that claims 330 and 342 are limited to an R group that contains at least one, but less than 6 carbon atoms. In other words, the rejected claims further limit the claims from which they depend by excluding R groups that contain 6 or more carbon atoms. To advance prosecution, and in no way acquiescing to the correctness of this

rejection, Applicants have amended claims 330 and 342 to recite the R group as containing at least one, but less than 6 carbon atoms. Because the metes and bounds of these claims are clearly ascertainable to one skilled in the art, these claims are not ambiguous. Accordingly, Applicants respectfully request that this rejection be withdrawn.

(g) The Examiner's rejection of claims 331, 332, 343, 344, 353, 354, 362, and 363 for use of "and" between the last two species has been rendered moot by the amendment changing "and" to "or" in each of these claims. Accordingly, Applicants respectfully request that this rejection be withdrawn.

(h) The Examiner's rejection of claims 333 and 335 for not reciting what the weight percentage of the mercapto alkanol ester is based on has been rendered moot by the amendment indicating that it is based on the vinyl halide resin. Accordingly, Applicants respectfully request that this rejection be withdrawn.

(i) The Examiner's rejection of claims 344, 345, and 361 for not having proper antecedent basis for the term "monocarboxylic acid" has been rendered moot by the amendment changing "monocarboxylic acid" to carboxylic acid" in the rejected claims. Accordingly, Applicants respectfully request that this rejection be withdrawn.

(j) The Examiner has rejected claim 348 for the following reasons:

(1) There is not proper antecedent basis for "The composition" and "said metal containing stabilizer." These reasons for rejection have been rendered moot by the above amendment to claim 348.

(2) The Examiner asserts that only 3 valencies of the tetravalent tin are satisfied when the (a) component in the composition is a mono alkyl tin bis(mercapto

alkanol ester) compound. This rejection has been rendered moot by the amendment to claim 348 to particularly recite a mono-**tris**(mercapto alkanol ester of a carboxylic acid). Accordingly, the metal containing stabilizer of claim 348 does not have a dangling bond, as asserted by the Examiner. For these reasons, Applicants respectfully request that this rejection be withdrawn.

V. Double Patenting Rejection

The Examiner has rejected claims 324-348 under the judicially created doctrine of double patenting as being unpatentable over claims 11-16 of U.S. Patent No. 4,412,897 to Kornbaum et al. ("Kornbaum") (of record), further in view of the following new references, U.S. Patent No. 4,093,484 to Harrison et al. ("Harrison"), U.S. Patent No. 4,278,518 to Bjellqvist et al. ("Bjellqvist"), and U.S. Patent No. 4,060,508 to Sugahara et al. ("Sugahara"). Applicants respectfully disagree and traverse this rejection for at least the following reasons.

As the record makes clear, the effective filing date of the pending application antedates the filing date of the Kornbaum patent. When using such a reference in a double patenting rejection, the Examiner may be required to show two-way obviousness. In that case, the Examiner can only support a double patenting rejection if he shows that the pending claims would have been obvious over the Kornbaum claims, and that the **Kornbaum claims** would have been obvious in view of the **pending claims**. The two threshold requirements that must be established before the two way obviousness standard must be applied are: (1) applicant could not have filed the claims in a single application; and (2) there was a delay on the part of the Patent Office. If

these two conditions are satisfied, then an Examiner relying on a later filed application (or patent), must show two-way obviousness in establishing a double patenting rejection. See MPEP 804, citing *In re Berg*, 46 USPQ2d 1226 (Fed. Cir. 1998) (“The two way exception can only apply when the applicant could not avoid separate filings, and even then, only if the PTO controlled the rate of prosecution to cause the later filed species claims to issue before the claims for a genus in an earlier application.”)

(1) Applicants Could Not Have Filed the Claims in a Single Application

The Federal Circuit has held that claims could have been filed in a single application when, despite nearly identical disclosures, an applicant simply choose to file separate applications. *In re Berg*, 46 USPQ2d 1226 (Fed. Cir. 1998). This is not the case in the pending application, which is directed to a process that is fundamentally different than the process for rendering polymers resistant to ionization radiation disclosed in Kornbaum. The pending application would not support claims 11-16 of Kornbaum. Thus, at the time **the pending application was filed** Applicants could not have claimed the subject matter recited in claims 11-16 of the Kornbaum patent. This is sufficient proof by itself to show that the first prong of the two way test is met.

Further, Applicants disagree with the Examiner’s assertion that, “applicants could clearly have filed the present claims in a single application since Example 2 in Table I at column 8 of [Kornbaum] is drawn to a composition containing an organotin stabilizer and a mercapto alkanol ester in such relative proportions that [] the amount of the ester exceeds that required to saturate the tin component in the organotin stabilizer.” [Office Action at 16]. The Examiner’s comments above further establish the incorrectness of the Examiner’s position. The disclosure of the earlier filed application, i.e., the pending

application, is determinative of whether the claims could have been filed in a single application, not the disclosure of the later filed application, i.e., the Kornbaum patent.

Further proof that the claims Kornbaum could not have been filed in the instant application is apparent from the inventive entities and the respective filing dates. The Kornbaum patent comprises a different inventive entity than the pending application and has an effective filing **more than two (2) years after the pending application**. It is inconceivable that Kornbaum would have waited two years to file his application if claims could have been filed at the same time of the instant application. Kornbaum is directed to a process of rendering a polymer resistant to ionizing radiation, as well as a sterilized polymer composition made thereby. This patent expressly teaches that when the combination of a stabilizer based on a metallic compound, a thiol, and hydroquinone are incorporated into a polymer, the polymer exhibits unexpected resistance against ionizing radiation. [Col. 1, lines 58-65]. See *also*, col. 2, lines 20-25 (teaching that "the invention has an unexpected aspect in that it leads to stabilization against ionizing radiation."). Claim 11, and every claim dependent therefrom, specifically recite this combination of elements as leading to a sterilized polymer composition, "containing a stabilizing composition which is effective for preventing discoloration produced by sterilization."

In contrast, the present disclosure does not teach or suggest a process of rendering a polymer resistant to ionizing radiation or a sterilized polymer composition. The present disclosure does not teach the combination of a stabilizer based on a metallic compound, a thiol, and hydroquinone, nor that the incorporation of these elements into a polymer would lead to unexpected resistance to ionization radiation.

The Federal Circuit has held that a two way test may be appropriate when an applicant could not have filed both sets of claims in one application because the **second application** claimed an invention that was not adequately disclosed in the first application. See, e.g., *Berg*, 140 F.3d at 1436-1437. As in *Berg*, the **present application** would not support claims 11-16 of Kornbaum, and is indeed directed to a fundamentally different process than that disclosed in the later filed Kornbaum patent. Thus, Applicants clearly could not have filed such claims in the pending application.

(2) There Has Been an Unreasonable Delay in the Prosecution of the Present Application that Was Not the Fault of Applicants

As the file history makes clear, the present application has been pending before the U.S. Patent Office for more than 20 years. According to the Examiner, the administrative delay “seems to have resulted more from applicants’ activities than by what the Office did.” [Office Action at 16]. This position is completely unsupported in the present file history. Indeed, a closer review of the file history reveals that this position is nonsensical. Rather than support his position, the facts used by the Examiner are actually fatal to his conclusion. Moreover, the Examiner is again applying the wrong standard in maintaining his assertion that one-way obviousness is mandated. The administrative delay is looked at to see who is responsible for the delay in causing the second-filed application **to issue** prior to the first-filed application. See, e.g., *Berg*, 140 F.3d at 1436-1437. In the present case, the Kornbaum patent issued on November 1, 1983. As indicated on page 17 of the Office Action, at the time the patent issued, Applicants had taken only two extensions of time totaling two whole months. Even

more telling are the circumstances leading up to the two extensions of time taken by Applicants.

As shown in Exhibit 2, in September 1982, the Patent Office issued an Office Action allowing all the pending claims at that time (i.e., claims 60 to 71). At the same time, however, the Patent Office suspended prosecution for six months to determine whether an interference was to be declared. [i.d.] At the end of the six month period, on April 11, 1983, the Patent Office re-opened prosecution and withdrew the allowability of the claims. Amazingly, the Office issued new grounds of rejection and set a shortened statutory period of one month to reply to the Office Action. [i.d.] The shortened statutory period for responding to prior art rejections in most cases is three months. Under these circumstances, certainly the extensions of time for two months taken by Applicants are not to be unexpected, nor should they constitute an unreasonable delay in prosecution. Indeed, the Applicants filed a response within three months of receiving the Office Action of April 11, 1983.

The Kornbaum patent had already issued before the next Office Action was mailed. Without question, the undue delay up to the time the Kornbaum patent issued was caused by the Patent Office not by an unreasonable delay on the part of the Applicants. In addition, the table prepared by the Examiner on page 17 of the Office Action highlights the fact that after the Kornbaum patent issued, Applicants only took a total of eight months of extensions of time, over a ten year period! An average of less than one extension a year is hardly unreasonable delay. Furthermore, the Table prepared by the Examiner is revealing for what it does not show: what happened after 1992. Interestingly, the table prepared by the Examiner only goes up to June 29, 1992,

and thus does not include the fact that Applicants filed an appeal to the Board of Patent Appeals and Interferences on December 13, 1993, which was not decided until February 23, 1999, more than five years later. Soon after receiving the decision from the Board, Applicants rapidly exercised their administrative options by filing a Request for Rehearing on April 22, 1999, and a civil action in the United States District Court for the District of Columbia on September 27, 1999.

In summary, over the twenty (20) year period that this application was pending from August 1979 through September 1999, Applicants were responsible for extensions totaling 10 months, or one month every two years, while the Patent Office was responsible for delays reaching almost 70 months. Hence, the responsibility in causing prosecution delays in this application falls squarely on the Patent Office and not on Applicants.

As the present application would not support the claims of the Kornbaum patent, thus precluding those claims from being claimed in the pending application, and there have been administrative delays by the Patent Office that delayed prosecution of the pending application allowing the Kornbaum patent to issue before the pending application, a two-way test for obviousness is justified in this case.

(3) Two-Way Obviousness

When making a two way obviousness determination, the Graham obviousness analysis must be applied twice, once each with the application claims and the Kornbaum patent claims at issue. A double patenting rejection is proper only when each analysis compels a conclusion that the claims at issue are obvious variations of the invention defined in the claims of the other application/patent.

(a) The Kornbaum Claims are not Obvious in view of the Pending Claims

As discussed above, the method of making a sterilized composition, as well as the composition claimed in Kornbaum, are fundamentally different than the compositions and methods claimed. The pending application neither discloses, nor remotely suggests, a stabilizer based on a metallic compound, a thiol, and hydroquinone. For this reason, the pending claims clearly do not teach or suggest the combination of a stabilizer based on a metallic compound, a thiol, and hydroquinone.

In order to establish a prima facie case of obviousness, a reference must teach or suggest all the claim limitations. See M.P.E.P. 2143. Because the pending claims do not mention a sterilized polymer composition, let alone that the combination of a stabilizer based on a metallic compound, a thiol, and hydroquinone, the pending claims do not teach or suggest all the limitations of Kornbaum's claims. Because the Kornbaum claims are not an obvious variation of the invention defined in the pending claims, no obvious double patenting rejection can be made. For this reason alone, the double patenting rejection is improper and should be withdrawn.

(b) The Pending Claims are Not Obvious in View of the Kornbaum Claims With or Without the Other Cited References

In addition, the analysis of the pending claims also shows that such claims are not an obvious variation of the Kornbaum claims, taken alone or in view of secondary references Harrison, Bjellqvist, and Sugahara. For example, the Examiner admits that the Kornbaum claims differ from the present claims in that they involve a sterilized vinyl halide polymer composition which contains an additional ingredient beyond the organostannic compound and a mercapto alkanol ester, namely hydroquinone. To

remedy these deficiencies, the Examiner relies on Harrison, Bjellqvist, and Sugahara. These references also fail for at least the following reasons.

While Sugahara may be similar, and in fact cumulative to the Kornbaum reference in that it teaches a stabilizer containing hydroquinone compounds (col. 12, lines 30-37), it is not remotely similar to the claimed invention. The Examiner apparently applies this reference because "it is evident that hydroquinones serve a useful function as 'organic stabilizers' for chlorine containing polymers, such as PVC." [Office Action at 13].

While it is true that Sugahara teaches hydroquinones being used as organic stabilizers, it is in an environment that is fundamentally different from the claimed invention. For example, at col. 2, lines 3-24, Sugahara teaches that his invention is directed to metal silicate based stabilizers for chlorine containing polymers. Sugahara goes on to teach that thermal stability is an important factor to control in his process because of the pore volume that is inherent to these metal silicate containing stabilizers. [Col. 2, lines 7-14]. Because this inherent pore volume has a "conspicuous tendency to cause blowing in chlorine containing polymers at the processing step," Sugahara teaches that organic stabilizers, such as hydroquinone are used. [Col. 2, lines 7-24]. In other words, "the blowing tendency of the chlorine containing polymers at the processing step can be prominently controlled" by using organic stabilizers, such as hydroquinone, that fill the pores of the silicate. [Col. 2, lines 16-24].

Contrary to the Examiner's position, therefore, there would have been no motivation, and thus it would have not have been obvious, to forego the use of the organic stabilizer (i.e., hydroquinone) in the process of Sugahara, because of the

detrimental effects associated with the blowing step. The Examiner's attention is specifically directed to well-known Federal Circuit decisions holding that if a proposal for modifying the prior art in an effort to attain the claimed invention causes the art to become inoperable or destroys its intended function, then the requisite motivation to make the modification would not have existed. See, *In re Fritch*, 972 F.2d 1260, 1265-66, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992); *In re Ratti*, 270 F.2d 810, 813, 123 U.S.P.Q. 349, 352 (C.C.P.A. 1959) (holding the suggested combination of references improper under section 103 because it "would require a substantial reconstruction and redesign of the elements shown in [a prior art reference] as well as a change in the basic principles under which [that reference's] construction was designed to operate."). Indeed, as Sugahara is clearly directed to remedying the problems of its stabilizer by using the disclosed organic stabilizers, the Examiner's modification would necessarily destroy the intended operation taught in Sugahara, and thus is improper.

Furthermore, neither Kornbaum nor Sugahara remotely suggests that when a mercapto alkanol ester of a carboxylic acid is present in an amount from about 2 to about 25 times the amount of the tin in the metal containing stabilizer, the mercapto alkanol ester can replace from about 20% to about 90% by weight of the metal containing stabilizer such that the resulting composition has a heat or light stability at least comparable to a composition in which the mercapto alkanol ester does not replace about 20% to about 90% by weight of the metal containing stabilizer. Harrison and Bjellqvist do not remedy these deficiencies.

In fact, the Examiner's reliance on Harrison and Bjellqvist is improper, as both references are non-analogous art, and are thus non-applicable to the claimed invention.

A prior art reference must be "analogous prior art" for the purpose of analyzing the obviousness of the present invention. M.P.E.P. § 2141.01(a). In order for a reference to be analogous art, the reference must either (1) be in the current invention's field of endeavor, or (2) be reasonably pertinent to the particular problem with which the inventors were concerned. See *In re Oetiker*, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). Further, "[t]he combination of elements from non-analogous sources, in a manner that reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a *prima facie* case of obviousness." *Oetiker*, at 1446. If the reference is non-analogous art, it cannot be used to support a rejection under 35 U.S.C. §103. M.P.E.P. § 2141.01(a).

In the present case, it is undisputed that both Harrison and Bjellqvist are directed to PVC articles. [See Office Action at 13]. In particular, these references teach treating such PVC articles by irradiation. For example, Harrison is directed to a method of making surgical catheters and tubes, which are subsequently sterilized by exposure to ethylene oxide or gamma radiation. (Col. 2, lines 16-27).

Bjellqvist is directed to a method of reducing the monomer residue in polymer plastics by exposing the polymer plastic to radiation. (Col. 2, line 60 to col. 3, line 11). It is clear that the claimed invention is not concerned with, and thus never recites irradiation of polymers. In fact, the secondary references are not even in the same field of endeavor as the claimed invention.

(c) Different Fields of Endeavor

To be considered analogous art based on the same field of endeavor, the specific and detailed fields of the cited art must be the same. A common generalized or abstracted field is not sufficient. For example, in *King Instrument Corp. v. Otari Corp.*, the Federal Circuit held that an apparatus for splicing magnetic tape into closed cassettes was not in the same field of endeavor as an apparatus related to splicing photographic film. 226 U.S.P.Q. 402 (Fed. Cir. 1985). The Federal Circuit held that these devices belonged to different fields of endeavor, notwithstanding the fact that both are directed to splicing films or tapes for information storage. Thus, the Federal Circuit has clearly taken the position that a “field of endeavor” is narrowly defined, and relates to the specific direction or application of an invention. Like *King*, merely because both Harrison and Bjellqvist teach treating PVC articles by irradiation does not lead one to conclude that they are directed to the same field of endeavor as the claimed invention, which is directed to stabilizers, and methods of stabilizing vinyl halide resins from heat and light, not from irradiation.

Similarly, in *In re Clay*, the Federal Circuit held, notwithstanding the fact that both the invention and the cited reference made use of very similar gel compositions, that the invention and the reference belonged to different fields of endeavor. 23 U.S.P.Q.2d 1058 (Fed. Cir. 1992). Specifically, the invention of *Clay* was a process of filling dead volume in a petroleum tank using a gel, and a reference to Syndansk disclosed a process for reducing the permeability of hydrocarbon bearing formations using a similar gel. *Id.* at 1059. The Patent Office argued that the invention and the cited reference were within the same field of endeavor of “maximizing withdrawal of petroleum stored in

petroleum reserves.” *Id.* at 1060 (internal quotations omitted). However, the Federal Circuit rejected this overly broad characterization, and noted that, more specifically, *Clay*’s field of endeavor is the storage of refined liquid hydrocarbons, while *Syndansk*’s field of endeavor is the extraction of crude petroleum. *Id.* The Federal Circuit thus held that “[t]he board clearly erred in considering *Syndansk* to be within the same field of endeavor as *Clay*.” *Id.* Again, the Federal Circuit narrowly defined the relevant field of endeavor, and was not swayed in this determination by any underlying similarities in the compositions used.

(d) Problems to be Solved

In order for a cited reference to be considered analogous art based on being reasonably pertinent to the particular problem with which the inventors were concerned, the field of the cited reference must be one in which one skilled in the art, seeking to solve the particular problem, would be reasonably expected to look. For example, in *In re Oetiker*, the invention related to a metal hose clamp with a hook that solves the problem of maintaining the preassembly condition of the clamp and automatic disengagement when the clamp is tightened. 24 U.S.P.Q.2d 1443, 1446 (Fed. Cir. 1992). The PTO cited a reference directed to garment fasteners in a rejection of the claimed invention under 35 U.S.C. §103. Notwithstanding the fact that the problem to be solved was one of fastening, the Federal Circuit found no evidence “that one skilled in the art, seeking to solve the problem of fastening a hose clamp, would reasonably be expected or motivated to look to fasteners for garments.” *Id.* The Court further held that “[t]he combination of elements from non-analogous sources, in a manner that

reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a *prima facie* case of obviousness." *Id.*

Similarly, in *Wang Laboratories Inc. v. Toshiba Corp.*, the Federal Circuit upheld a determination that an invention directed to memory modules for personal computers was neither in the same field of endeavor nor reasonably pertinent to the problem solved as prior art directed to memory modules for controllers for large industrial machinery. 26 U.S.P.Q. 1767, 1773 (Fed. Cir. 1993). The Federal Circuit upheld a determination that one skilled in the art of memory modules for personal computers seeking to solve problems related thereto would not reasonably be expected or motivated to look to memory modules for industrial equipment controls, despite the fact that the invention and the prior art were both directed to computer memory modules.

(e) Harrison and Bjellqvist Relate to Radiation Degradation not Thermal and Light Degradation

Unlike thermal and light degradation, which is a selective degradation that primarily acts on weaker bonds, degradation from radiation, as taught in Harrison and Bjellqvist, is a highly unselective degradation. Irradiation degradation degrades polymers by creating high energy radicals that tend to degrade both weak and strong bonds in no particular order. Organic stabilizers such as hydroquinone have been used to prevent degradation from irradiation.

In contrast, the field of invention of the present invention relates to metal containing stabilizers that impart heat and light stability to vinyl halide polymers, but not stabilization from radiation. In particular, the present invention is directed to mercapto alkanol ester that can be used together with a metal containing stabilizer to achieve

substantially improved stability properties, or which can replace a substantial portion of the metal in a metal containing stabilizer with no significant reduction in stability.

As shown, both Harrison and Bjellqvist are directed to subject matter that is distinct from the field of endeavor and the problems to be solved by the present invention. For these reasons, they are non-analogous art and are improperly applied to the claimed invention.

For all the above reasons, the double patenting rejection based on Kornbaum claims 11-16 is improper and should be withdrawn.

VI. Prior Art Rejections

a. Overview

In the late 1970's, the Applicants challenged the then accepted wisdom in the field of chemical stabilizers for plastic materials, particularly vinyl halide resins. Up to that point, stabilizers used in the manufacturing of plastics were generally made of metal-containing materials, such as organotin compounds. As shown on page 19 of the specification, despite knowing that the claimed mercapto alkanol ester imparts little, if any, stability to vinyl halide resins, Applicants sought to improve on stability properties by adding, and in some instances, replacing a portion of the metal containing stabilizer with a sulfur containing ester. While the prior art allegedly disclosed stabilizing compositions further comprising a sulfur containing ester, the prior art did not teach the benefits of using organotin compounds in combination with a "reverse ester," as claimed, i.e., an ester in which the sulfur atom was attached to the alcohol, as opposed to the acid residue of the carboxylic group.

Applicants discovered that they could improve the properties of a stabilizing composition and/or reduce the cost of a stabilizing composition by using the unique combination of an organotin compound and the claimed reverse ester. Specifically, Applicants have discovered that a mercaptan complexed with a tin atom, when used in combination with an uncomplexed mercaptan (or a reverse ester mercaptan not containing a metal atom), in an amount of about 2 to about 25 times the amount of the tin in an organotin compound, results in a dramatically improved level of stabilization over chemical stabilizers used to that point. Furthermore, Applicants discovered that they could reduce the organotin compound by up to 90% by weight of the organotin compound without sacrificing stabilization properties.

As shown below, the prior art does not teach or suggest such stabilizing compositions or methods of stabilizing vinyl halide resins using such compositions.

b. Rejections Under 35 U.S.C. §102(b)

The Examiner rejected claims 324-326, 335-338, 347-351, 353-360, 363-366 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,062,881 to Kugele ("Kugele").

As the specification makes clear, the intent of Applicants was to develop a stabilizing composition that exhibits improved properties by using the combination of a metal containing stabilizer and a metal-free mercapto ester. [See, e.g., Abstract or page 19, first paragraph]. Applicants have discovered that when these two compounds are used in combination it is possible to replace from about 20% to about 90% by weight of the Sn in the metal containing stabilizer without a substantial reduction in the

level of heat or light stability. In other words, Applicants discovered that, despite providing no or minimal stability properties when used alone, mercapto alkanol ester can replace from about 20% to about 90% by weight of a metal containing stabilizer such that the resulting composition has a heat or light stability at least comparable to a composition in which the mercapto alkanol ester does not replace about 20% to about 90% by weight of the metal containing stabilizer.

Furthermore, as shown below, the assumptions underlying the Examiner's rejections do not follow the intent of the Applicants as expressly described in the present disclosure, and particularly claimed. For example, in applying the rejection over Kugele, the Examiner noted that he interpreted the (b) component of the independent claims, i.e., the mercapto alkanol ester, as comprising wholly or partly mercapto alkanol ester. [Office Action at 19]. In other words, according to the Examiner, as long as Kugele teaches a metal containing stabilizer is present with even a fragment of mercapto alkanol ester, it anticipates the claimed invention. Applicants disagree.

To support this anticipation rejection, the Examiner relies on "Sample 31," as described in Kugele at cols. 27-28, Table VII. According to the Examiner, Sample 31 teaches "a stabilizer composition comprising dimethyltin bis(2-mercaptoethyl perargonate), which the Examiner equates to part (A) of the invention, and monomethyltin tris(2-mercaptoethyl perargonate), which the Examiner equates to part (B) of the invention. [Office Action at page 21]. As shown however, the monomethyltin tris(2-mercaptoethyl perargonate), which the Examiner equates to part (B) of the invention is a metal (tin) containing component. The Examiner recognizes this, but

believes that part (B) of the invention still reads on it because it "contains a 2-mercaptoethyl perargonate fragment." [*Id.*].

Furthermore, in allegedly calculating the amount of mercapto alkanol ester in the B component, the Examiner admittedly did not take into consideration the amounts of methyl group and Sn component of the monomethyltin tris(2-mercaptoethyl perargonate). [Office Action at 22]. The Examiner clearly had to make this modification in his calculation because he recognized that his rationale was not in accordance with what Applicants' disclosure taught. In fact, the Examiner's rationale for making the modified calculation does not even make sense. If the Examiner was computing the amount of mercapto alkanol ester in portion B "in checking to see if Kugele meets the claimed limitation," then why would he not look to the complete metal containing stabilizer disclosed in Kugele? For example, Kugele describes the metal containing stabilizer as comprising the mixture of monoalkyltin and dialkyltin compounds that the Examiner is trying to split into Applicants' (A) and (B) components. [Kugele, col. 28, lines 28-32].

On page 15 of the present specification Applicants similarly describe the metal containing stabilizers as monoalkyltin and dialkyltin compounds, and exemplify specific embodiments as including organotin oxides of mercaptoacids, derivatives of mercaptoalcohols and the mercaptoacid and mercaptoalcohol esters. Applicants' specification, however, clearly teaches that such compounds only represent the (A) component of the claimed invention. In other words, the Examiner is trying to define component (B) of the claimed invention in a way that is inconsistent with the present disclosure and claims, and thus the intent of the Applicants.

Despite the Examiner's assertion, it is clear that Kugele does not disclose using a metal containing stabilizer in combination with a metal-free mercapto alkanol ester of a carboxylic acid in an amount from 2 to 25 times the amount of the Sn component of the metal containing stabilizer. Accordingly, Kugele certainly does not disclose a stabilizing composition in which the mercapto alkanol ester replaces from about 20% to about 90% by weight of a metal containing stabilizer will result in a composition that has a heat or light stability at least comparable to a composition in which the mercapto alkanol ester does not replace about 20% to about 90% by weight of the metal containing stabilizer. Because Kugele does not meet each and every claim limitation of the claimed invention, it does not anticipate the claimed invention. *Glaxo v. Novopharm, Inc.*, 34 USPQ2d 1565 (Fed.Cir. 1995); and *Lewmar Marine, Inc. v. Barient, Inc.*, 827 F.2d 744, 747 (Fed. Cir. 1987).

Moreover, the reference must clearly and unequivocally disclose the claimed composition to one of ordinary skill in the art "without any need for picking, choosing and combining various disclosures." *In re Arkley*, 455 F.2d 586, 587, 172 U.S.P.Q. 524, 526 (C.P.P.A. 1972). In the present case, Kugele discloses 56 examples of stabilizers. See, cols. 11-28. As shown, however, Kugele does not teach any stabilizing composition in which the mercapto alkanol ester reduces the tin amount in the metal containing stabilizer by about 20% to about 90% by weight, let alone the additional benefits of this combination, e.g., achieving the same level of stability with much lower amounts of metal containing stabilizer. For the same reasons, Kugele also does not teach a composition comprising a metal containing stabilizer containing the bridged sulfide compounds recited in new claims 371-383 and certainly not a metal containing

stabilizer which contains a mixture of at least 2 of the compounds described in formulas I, II, and III, as recited in claims 384-401.

In order for one of ordinary skill in the art to attempt to arrive at the presently claimed invention as asserted by the Examiner, the skilled artisan would need to "pick and choose" not only from the many examples disclosed in this reference, but to modify a particular composition in a way that is perverse to Applicants' intent. Because picking and choosing would be needed in an attempt to arrive at the claimed invention, Kugele would fail to anticipate the claimed invention for this additional reason.

In addition, Kugele does not suggest manipulation of the tin content of the metal containing stabilizer, and certainly not to the degree of manipulation permitted by the claims. Accordingly, Kugele also does not render the claimed invention obvious.

Applicants thus request that this reason for rejection be withdrawn.

c. Rejections Under 35 U.S.C. §102(e)

The Examiner rejected claims 324-326, 335-338, 347-351, 353-360, 363-366 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 4,115,352 to Bohen ("Bohen").

Like Kugele, Bohen does not disclose a stabilizing composition in which the mercapto alkanol ester replaces from about 20% to about 90% by weight of the Sn in the metal containing stabilizer without a substantial reduction in the level of heat or light stability. For example, Bohen does not teach or even suggest manipulating the amount of metal in a metal containing stabilizer based on the amount of mercapto alkanol ester of a carboxylic acid. For the same reasons, Bohen also does not teach a composition

comprising a metal containing stabilizer containing the bridged sulfide compounds recited in new claims 371-383 and certainly not a metal containing stabilizer which contains a mixture of at least 2 of the compounds described in formulas I, II, and III, as recited in claims 384-396. Accordingly, it does not meet each and every limitation claimed. Thus, Bohen also does not anticipate the claimed invention. *Glaxo*, 34 USPQ2d at 1565; and *Lewmar Marine*, 827 F.2d at 747. Applicants thus request that this rejection be withdrawn.

Like Kugele, there is no suggestion or motivation in Bohen to achieve a composition comprising a mercapto alkanol ester of a carboxylic acid in an amount from 2 to 25 times the amount of the claimed metal containing stabilizer, such the mercapto alkanol ester replaces from about 20% to about 90% by weight of a metal containing stabilizer and still result in a composition that has a heat or light stability at least comparable to a composition in which the mercapto alkanol ester does not replace about 20% to about 90% by weight of the metal containing stabilizer. Accordingly, Bohen also does not render the claimed invention obvious.

Applicants thus request that this reason for rejection be withdrawn.

d. Rejections Under 35 U.S.C. §103

(1) The Examiner has rejected claims 324-326, 335-338, 347-351, 353-360, and 363-366 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 2,707,178 to Wilson ("Wilson") in view of U.S. Patent No. 2,641,588 to Leistner et al. ("Leistner"). The Examiner asserts that Wilson discloses stabilizers for PVC comprising

any primary stabilizer for vinyl chloride resins and a secondary stabilizer which is a resinous ester of a mercapto alcohol and a dicarboxylic acid. [Office Action at 28]. The Examiner further asserts that "Wilson's invention broadly accommodates 'any' stabilizer" and points to a teaching in Wilson which allegedly exemplifies organotin compounds such as dibutyltin dilaurate and dibutyltin maleate. [Id. at 29].

Recognizing that Wilson does not teach the claimed metal containing stabilizer, the Examiner relies on Leistner '588 for this teaching. According to the Examiner, Leistner teaches organotin stabilizers that are "identical to the presently claimed stabilizers," which are taught as "more effective" than the stabilizers disclosed in Wilson. [Id. at 31]. The Examiner further asserts that Leistner provides the motivation to substitute organotin stabilizers having the same structure as those in the present claims instead of the relatively less effective compounds disclosed in Wilson. [Id.]. Applicants disagree.

To establish a *prima facie* case of obviousness over a combination of references, the Examiner must show, (1) the prior art reference teaches or suggests all the claim limitations, and (2) some suggestion or motivation either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference's teachings. See M.P.E.P. § 2143 and *In re Vaeck*, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991) (citing *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988)). Here, the Examiner has failed to meet either of these criteria and thus has not established a *prima facie* case of obviousness.

Furthermore, when a *prima facie* case of obviousness is being evaluated, 35 U.S.C. §103(a) expressly requires consideration of the claimed invention "as a whole".

In re Langer, 465 F.2d 896, 897, 175 U.S.P.Q. 169, 170 (C.C.P.A. 1972). In the present case, the Examiner cannot accord weight to all of the elements of the instant claims and still conclude that Wilson and Leistner render the claimed invention obvious. For example, Wilson is at least deficient with regard to (1) the claimed metal containing stabilizers, (2) a mercapto alkanol ester of a carboxylic acid in amounts from about 2 to about 25 times the amount of the claimed metal containing stabilizer, and (3) a stabilizing composition in which the mercapto alkanol ester replaces from about 20% to about 90% by weight of a metal containing stabilizer wherein the resulting composition has a heat or light stability at least comparable to a composition in which the mercapto alkanol ester does not replace about 20% to about 90% by weight of the metal containing stabilizer. Leistner does not remedy the deficiencies in Wilson.

While Leistner may arguably teach certain metal containing stabilizers and that these metal containing stabilizers are more effective than the metal containing stabilizer disclosed in Wilson, see, e.g., col. 1, lines 12-25, Leistner attributes the improved stability properties to either "the pronounced receptiveness for by-product HCl from decomposition of the resin or to the formation of oxidation products of mercaptan." [Col. 4, lines 40-46]. However, Leistner does not teach or suggest that improved stability results from the combination of the claimed metal containing stabilizer and a mercapto alkanol ester of a carboxylic acid, let alone in the claimed amounts. Further, Leistner does not teach a metal containing stabilizer comprising the bridged sulfur compounds recited in claims 371-383, or a metal containing stabilizer which contains a mixture of at least 2 of the compounds described in formulas I, II, and III, as recited in claims 384-401.

Assuming, arguendo, that Wilson suggests using a mercapto alkanol ester of a carboxylic acid in combination with a metal containing stabilizer, nothing other than the Applicants' disclosure itself suggests the claimed invention. However, the requisite motivation must come from the prior art, not applicant's specification. *In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531-1532 (Fed. Cir. 1988) ("[t]here must be a reason or suggestion in the art for selecting the procedure used, other than the knowledge learned from the applicant's disclosure."). *See also Grain Processing Corp. v. American Maize-Prods. Co.*, 840 F.2d 902, 907, 5 U.S.P.Q.2d 1788, 1792 (Fed. Cir. 1988).

Because Wilson and Leistner fail to suggest, separately or in combination, a mercapto alkanol ester of a carboxylic acid present in an amount from 2 to 25 times the amount of the claimed metal containing stabilizer, and replacing the metal containing stabilizer by about 20% to 90% by weight or that the resulting composition will have a heat or light stability at least comparable to a composition in which the mercapto alkanol ester does not replace about 20% to about 90% by weight of the metal containing stabilizer, this combination of references does not teach every claimed element. In addition, there is no suggestion or motivation to modify either reference to achieve the above elements. Thus, these references do not meet the requirements for establishing a *prima facie* case of obviousness. *See* M.P.E.P. § 2143 and *In re Vaeck*, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991) (citing *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988)).

For these reasons, the combination rejection based on Wilson and Leistner is improper and should be withdrawn.

(2) The Examiner has rejected claims 324-326, 335-338, 347-351, 353-360, and 363-366 under 35 U.S.C. §103(a) as being unpatentable over at least one of U.S. Patent No. 2,870,182 to Leistner et al. ("Leistner '182") or U.S. Patent No. 2,914,506 to Mack ("Mack"), or U.S. Patent No. 3,931,263 to Molt ("Molt"), in view of U.S. Patent No. 2,460,436 to Shoemaker et al. ("Shoemaker"). Applicants respectfully traverse this rejection.

According to the Examiner, any one of Leistner '182, Mack, or Molt discloses stabilizer compositions for vinyl chloride resins. [Office Action at 32]. However, the Examiner admits that none of these references teach or suggest the claimed mercapto alkanol ester. Rather, the Examiner relies on teachings in each of these references describing the alleged use of phthalate-based plasticizers (rather than the claimed mercapto alkanol ester) with organotin stabilizers, and allegedly in the claimed amounts. [*Id.*].

To remedy the deficiencies in the three primary references regarding the claimed mercapto alkanol ester, the Examiner relies on Shoemaker, which is alleged to teach that "mercapto alkanol esters of polybasic acids 'present considerable advantage over prior art organic ester plasticizers.'" [Office Action at 34]. The Examiner asserts that "in view of the clear cut motivation given by Shoemaker et al. to use mercapto alcohol esters, i.e., mercapto alkanol esters, instead of the conventional phthalate ester plasticizers," it would have been obvious to substitute mercapto alcohol esters for the phthalate ester plasticizers in the inventions of any one of the primary references. [*Id.*].

Assuming, arguendo, that there is motivation for one of ordinary skill in the art to replace the phthalate plasticizers of the primary references with the mercapto alkanol esters of Shoemaker, the combination of teachings fails to suggest to one of skill in the art the use of a metal containing stabilizer in combination with a mercapto alkanol ester of a carboxylic acid in an amount from about 2 to about 25 times the amount of the Sn component of the metal containing stabilizer, or replacing about 20% to about 90% of the claimed metal stabilizers with the mercapto alkanol esters to achieve comparable stability to a composition where mercapto alkanol esters do not replace about 20% to about 90% of the metal containing stabilizers.

Plasticizers and stabilizers have two very different functions. For example, as shown in the universally recognized reference on plastic additives, Plastic Additives Handbook, R. Gachter and H. Muller, 3rd ed., Hanser Publishers, New York, a copy of the relevant portions of which is attached herewith, stabilizers and plasticizers are not the same. Indeed, as shown in the attached Table of Contents, this reference particularly separates stabilizers and plasticizers. For example, the authors devote the first four chapters to various stabilizers, including (1) Antioxidants, (2) Metal Deactivators, (3) Light Stabilizers and (4) PVC Stabilizers, but separates plasticizers into its own chapter (Chapter 5), which is the first chapter devoted to additives that are not stabilizers. In chapter 5, a plasticizer is defined as "a substance that is added to a material (usually a plastic, resin, or elastomer) to improve its processability, flexibility, and stretchability. [See, paragraph 5.2.1]. This definition clearly does not describe a stabilizer. In addition, the specific teachings of each reference further undercut the Examiner's assertion of obviousness.

For example, Leistner '182 teaches, at most, only one aspect of the claimed invention, i.e., a metal containing stabilizer. However, this reference does not teach or suggest using this metal containing stabilizer in combination with a mercapto alkanol ester of a carboxylic acid in the claimed amounts. Indeed, the example relied on by the Examiner shows using fifty (50) times the amount of a different plasticizer with this metal containing stabilizer. [See, e.g., Leistner '182 at Example 7, col. 3]. Because this reference teaches a different plasticizer in an amount far outside the claimed range it clearly does not render obvious the claimed invention, even in view of Shoemaker.

Similarly, Mack describes metal containing stabilizers in combination with phthalate plasticizers. Like Leistner, however, this reference does not teach or suggest using this metal containing stabilizer in combination with a mercapto alkanol ester of a carboxylic acid in the claimed amounts. Again, the example relied on by the Examiner shows using fifty (50) times the amount of a different plasticizer with this metal containing stabilizer. [See, e.g., Mack at Example 1, col. 5].

The Examiner's reliance on the Molt is equally as flawed. For example, the Examiner relies on the reactions depicted at col. 13, and has annotated Example 7 to show the claimed tin stabilizers. Recognizing that this reference does not teach or suggest using this metal containing stabilizer in combination with a mercapto alkanol ester of a carboxylic acid, as claimed, the Examiner points to a teaching in Molt regarding the use of phthalate based plasticizers as the basis for his rejection.

The combination of Molt (or Leistner or Mack) with Shoemaker does not suggest that when a mercapto alkanol ester of a carboxylic acid is present in an amount from about 2 to about 25 times the amount of the claimed metal containing

stabilizer, the mercapto alkanol ester can replace from about 20% to about 90% by weight of a metal containing stabilizer. The multiple references do not teach or suggest that the resulting composition will exhibit a heat or light stability at least comparable to a composition in which the mercapto alkanol ester does not replace about 20% to about 90% by weight of the metal containing stabilizer. Other than Applicants disclosure, nothing suggests enabling manipulation of the metal containing stabilizer, or to the degree of manipulation permitted by the claims. Accordingly, this combination of references does not teach or suggest every claimed element.

Further, as the references do not teach or suggest the claimed combination of metal containing stabilizers and mercapto esters, they certainly do not teach stabilizers containing the bridged sulfide groups described in new claims 371-383, let alone stabilizers that comprise mixtures of at least two of the compounds represented by formulas I, II, and III, as recited in claims 384-401. Accordingly, the combination of Molt, or Leistner or Mack with Shoemaker do not meet the requirements for establishing a *prima facie* case of obviousness. See M.P.E.P. § 2143 and *In re Vaeck*, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991) (citing *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988)). For these reasons, the rejections based on Leistner, Mack or Molt in view of Shoemaker are improper and should be withdrawn.

(3) The Examiner has rejected claims 324-366 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,062,881 to Kugele ("Kugele") in view of U.S.

Patent No. 3,764,571 to Jennings et al. ("Jennings"). Applicants respectfully traverse this rejection.

As previously shown, Kugele does not disclose or suggest the claimed invention. To support this rejection, the Examiner relies, for example, on Example 48 of Kugele. [Office Action at 36]. While the Examiner recognizes that this Example does not teach the claimed organotin stabilizers, he attempts to remedy this deficiency with Jennings' teaching of organotin stabilizers. According to the Examiner, Jennings discloses stabilizers that are "very similar to the stabilizers of the present claims and Kugele." [Id. at 37]. However, merely identifying each of the claimed elements in the prior art is not sufficient to establish a prima facie case of obviousness. Rather, the suggestion, or motivation to modify or combine must be "clear and particular." See *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999). In the present case, the requisite motivation to modify the compositions disclosed in the prior art references in a manner necessary to arrive at the presently claimed stabilizers or methods of using them is absent.

According to the Examiner, the stabilizers disclosed in Jennings "are about equally effective in imparting similar heat stability values for compositions containing them" as those of the present claims and Kugele. [Office Action at 37]. However, the Examiner fails to provide any evidence to support this position. Further, as taught throughout Jennings, the properties associated with the metal containing stabilizer are not only a function of three "essential" components, but these properties are taught to vary with the weight ratio of these three components. [Col. 2, lines 41-46; See also, paragraph bridging cols. 1-2, teaching that "the remarkable heat stabilizing efficiency of"

the stabilizer composition is a result of "three essential components."]. In fact, Jennings teaches that:

either the metal carboxylate or the base component, alone contribute a very slight increase in the heat stabilization of vinyl halide resins in the presence of the organotin sulfur containing compound. Quite unexpectedly, however, **when both the metal carboxylate and base component are present** with the sulfur containing components, an unpredicted synergism in heat stabilization exists . . .

[Col. 2, lines 29-38](emphasis added).

Contrary to the Examiner's assertion, therefore, Jennings does not teach that its metal containing stabilizer are equally effective in imparting stability properties without two other "essential" components. Furthermore, even if the Examiner's assertion was accurate, it is not clear why one of skill in the art would substitute one organotin stabilizer for another that is "about equally effective in imparting similar heat stability values." [Office Action at 37].

For at least the foregoing reasons, the combination of Kugele and Jennings does not render the claimed invention obvious. Indeed, this rejection fails for substantially the same reasons as the previous obviousness rejections fail, e.g., the substitution of one component for another component does not remedy the underlying deficiencies in the primary reference. The combination of these references does not suggest a mercapto alkanol ester of a carboxylic acid is present in an amount from 2 to 25 times the amount of the claimed metal containing stabilizer the mercapto alkanol ester can replace from about 20% to about 90% by weight of a metal containing stabilizer. Thus, the combination of these references does not teach or suggest that the resulting

composition will exhibit a heat or light stability at least comparable to a composition in which the mercapto alkanol ester does not replace about 20% to about 90% by weight of the metal containing stabilizer.

Further, as the references do not teach or suggest the claimed combination of metal containing stabilizers and mercapto esters, they certainly do not teach stabilizers containing the bridged sulfide groups described in new claims 371-383, let alone stabilizers that comprise mixtures of at least two of the compounds represented by formulas I, II, and III, as recited in claims 384-401.

For these reasons, the rejection based on Kugele and Jennings is improper and should be withdrawn.

VII. Conclusion

In view of the foregoing remarks and amendments, Applicants respectfully request withdrawal of the outstanding rejections, and the timely allowance of the pending claims. The Examiner is invited to contact Louis Troilo at (202) 408-6020, if any matter may be resolved by a telephone conference.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account no. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

By: 

Louis M. Troilo
Reg. No. 45,284
Phone: 202-408-6020

Dated: October 20, 2003

Enclosures: (1) Plastic Additives Handbook, R. Gachter and H. Muller, 3rd ed., Hanser Publishers, New York (relevant portions only).
(2) Hawley's Condensed Chemical Dictionary, Revised by R.J. Lewis, Sr., 14th Ed., Wiley Publishers (relevant portions only).
(3) Office Action dated September 29, 1983.
(4) Office Action dated April 11, 1983.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com